

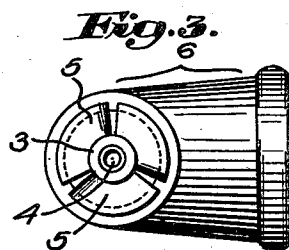
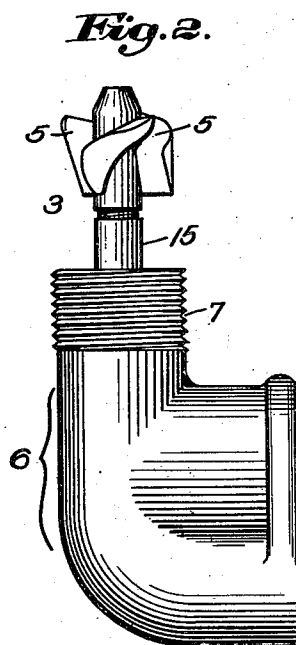
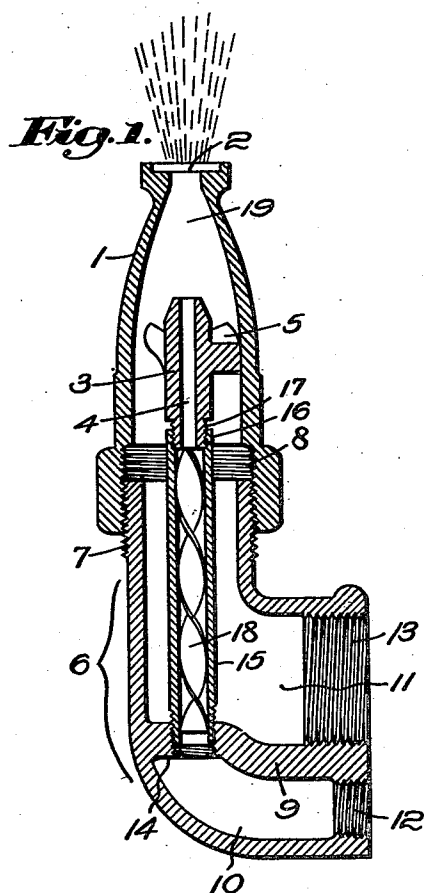
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1,513,624

L. H. PARKER

PLURAL FLUID NOZZLE AND METHOD OF LIQUID DISTRIBUTION

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PLURAL-FLUID NOZZLE AND METHOD OF LIQUID DISTRIBUTION.

Application filed June 3, 1920. Serial No. 386,244.

To all whom it may concern:

Be it known that I, LEE H. PARKER, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Plural-Fluid Nozzles and Methods of Liquid Distribution, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to plural fluid nozzles and to a method of plural fluid distribution.

In order that the principle of the invention may be readily understood, I have, in the accompanying drawings, represented the preferred form of nozzle embodying my invention and will set forth the best mode known to me for practising the same.

In the drawings,—

Fig. 1 is a vertical transverse section of a nozzle constructed in accordance with my invention;

Fig. 2 is a side elevation of the construction shown in Fig. 1, but with the upper or terminal member of the nozzle removed; and

Fig. 3 is a plan view of the construction shown in Fig. 2.

Referring more particularly to the drawing, I have therein represented a terminal nozzle casing 1 having a discharge orifice 2, and I position therein an inner core member 3 which may be integral with the casing 1 or structurally separate. While it may be of any suitable character, it is preferably of a form providing for an inner and desirably axial jet within the central longitudinal passage 4 and one or more surrounding jets which are formed by the spirals or helices 5. Generally speaking, the character of the said core may be similar to that of the core provided in the nozzle of the Eneas Patent No. 1,239,168, dated September 4, 1917, though any other suitable construction may be employed providing an inner jet,—desirably a central jet,—and one or more surrounding jets.

In accordance with the invention herein set forth, I employ two different fluids, one or both of which may be a liquid such as water, and I introduce one of said fluids through the central passage 4 and the other of said fluids is subjected to a whirling

action by the spiral or helices 5. While this result may be accomplished in any suitable manner, I have herein provided a second nozzle member 6 shown as threaded at its upper end 7 exteriorly so as to be received within the lower internally threaded end 8 of the terminal nozzle member 1. The said nozzle member 6 is provided with a transverse partition 9 providing two separate passages 10, 11, the entrance ends of which are threaded as indicated at 12, 13 for the reception of pipes conveying the two fluids from any desired sources. These two fluids may be of the same character, as, for example, water, but received from different sources or differing in some way from each other, or if desired the two fluids may be respectively air and water, or water and steam, or some other fluid and liquid.

The partition 9 is preferably threaded as indicated at 14 for the reception of a pipe or tube 15 which extends longitudinally of the nozzle member 6 and desirably centrally thereof, and is internally threaded at its upper end at 16 for the reception of the lower externally threaded end 17 of the core member 3. Interiorly the pipe 15 may be of any suitable character, but desirably I provide means such as the spiral 18 whereby the fluid or liquid passing therethrough may be given a whirling action. Such whirling action may be continued through or into the central passage 4 of the core member 3, as for example by providing a spiral member in said passage or by rifling the same, but in the present embodiment of my invention the passage 4 is represented as smooth or without a spiral.

In accordance with my invention, the fluid or liquid entering the passage 10 passes through the pipe 15 where it may or may not be given a rotary or whirling action, and after passing through the passage 4 it enters the mixing chamber 19. The fluid or liquid entering the passage 11 surrounds the pipe 15 and when it reaches the core 3 it receives a whirling motion due to the spirals, vanes or helices 5, so that such fluid or liquid enters the mixing chamber 19, where it becomes thoroughly mixed with the fluid or liquid entering said chamber through the inner passage 4. The two fluids or the two liquids after having become thoroughly mixed within the mixing chamber 19 issue through the orifice 2 in a spray

of substantially uniform homogeneity. The character of this spray is such, and particularly if two liquids be employed, that the constituent parts are thoroughly intermixed throughout the entire extent thereof. If the two liquids differ markedly in specific gravity, the intermixing may be more or less modified because of such difference.

Having thus disclosed one embodiment of my invention and the best mode known to me for practicing the method of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims—

1. A plural fluid spray nozzle comprising in combination a shell or casing having a restricted outlet and an interior formation providing a mixing chamber having a major diameter greater than that of said outlet and from which the mixed material is immediately discharged, a single piece basal part attached to said shell or casing to the rear of said mixing chamber and formed interiorly with integral partition means providing a plurality of intake passages for different fluid streams, tubular means extending forwardly from one of said intake passages and axially of a second thereof whereby coaxial fluid streams are separately conducted to said mixing chamber and admitted thereto at substantially the same transverse plane and means to impart a whirling action to one or more of said fluid streams prior to their entrance to said mixing chamber.

2. A plural fluid spray nozzle comprising in combination a shell or casing having a restricted outlet and an interior formation providing a mixing chamber having a major diameter greater than that of said outlet and from which the mixed material is immediately discharged, a single piece basal part attached to said shell or casing to the rear of said mixing chamber and formed interiorly with integral partition means providing separate intake passages for two fluid streams, tubular means extending forwardly from one of said intake passages to the rear portion of said mixing chamber and longitudinally positioned within said other intake passage whereby said two fluid streams are separately conducted one within the other to substantially the same transverse plane at the rear of said mixing chamber and there admitted, and means intermediate said tubular means and the shell or casing to impart a whirling action to the outer fluid stream.

3. A plural fluid spray nozzle adapted to discharge liquid into the open comprising in combination, a shell or casing having an

outlet to the open atmosphere and having an interior formation providing a walled mixing chamber from which the mixed material is immediately discharged through said outlet, a basal part detachably connected to said shell or casing and having an integrally formed partition providing a plurality of inlet passages, and means to direct liquids on each side of said partition, and whereby one stream of liquid is caused to flow substantially axially of the nozzle and the other stream is caused to partake of a whirling action about the inner stream, both of said means terminating in substantially the same transverse plane and to the rear of said mixing chamber.

4. A plural fluid spray nozzle comprising in combination a shell or casing having a restricted outlet and an interior formation providing a mixing chamber having a major diameter greater than that of said outlet and from which the mixed material is immediately discharged, a single piece basal part attached to said shell or casing to the rear of said mixing chamber and formed interiorly with integral partition means providing separate intake passages for two fluid streams, tubular means extending forwardly from one of said intake passages to the rear portion of said mixing chamber and longitudinally positioned within said other intake passage whereby said two fluid streams are separately conducted one within the other to substantially the same transverse plane at the rear of said mixing chamber and there admitted, means intermediate said tubular means and the shell or casing to impart a whirling action to the outer fluid stream, and spiral means within said tubular means for producing a whirling motion of the inner fluid stream.

5. A plural fluid spray nozzle comprising in combination, a shell or casing 1 having a relatively small outlet 2 and an inlet, a nozzle member 6 secured at its upper end to the inlet of the nozzle 1, a partition 9 in the member 6 providing for the passage of a plurality of liquids, a pipe 15 extending from the partition 9 for the passage of one of said liquids, and a core member 3 having vanes 5 at the forward end thereof connected to the pipe 15 and positioned within the nozzle 1 and terminating rearwardly of said outlet 2,

6. A plural fluid spray nozzle comprising in combination, a nozzle member 1 having an outlet 2 and an inlet, the forward interior walls of said nozzle member forming a mixing chamber 19, a second nozzle member 6 attached to said nozzle 1 and having a plurality of inlets for conducting a plurality of streams to the nozzle member 1, there being a core member 3 within the nozzle 1 rearwardly of said mixing chamber and said core member having an axial passage 4 and

having vanes 5 forming a plurality of surrounding passages substantially co-terminal with said passage 4, said axial passage and surrounding passages being in direct communication respectively with the inlets of said second nozzle member 6, said core member 3 and the axial passage 4 having communication with one only of said plurality of inlets.

7. A plural fluid spray nozzle adapted to discharge liquid into the open comprising in combination, a tubular basal part having an interior partition, means for admitting fluids at either side of said partition, a pipe removably supported by the partition for the passage of one of the fluids, a longitudinally apertured core removably supported by said pipe in alignment therewith and having vanes upon its periphery providing a plurality of passages for the other fluid, and a casing removably carried by said basal part and forming a mixing chamber in advance of said core.

8. A plural fluid spray nozzle adapted to discharge liquid into the open in a spray of substantially uniform homogeneity, comprising in combination, a tubular basal part having an interior partition, means for admitting fluids at either side of said partition, a pipe removably supported by the partition for the passage of one of the fluids, a spiral within said pipe for imparting a whirling motion to said fluid, a longitudinally apertured core removably supported by said pipe in alignment therewith and having vanes upon its periphery providing a plurality of passages for the other fluid, and a casing removably carried by said basal part and forming a mixing chamber in advance of said core.

9. A plural fluid spray nozzle adapted to discharge liquid into the open comprising in combination an elongated hollow basal part having near one end thereof an interior par-

tition forming a plurality of adjacent substantially parallel passages for the admission of fluids, a pipe for the passage of one of said fluids extending forwardly from said partition and substantially axially of said basal part, a longitudinally apertured core connected with said pipe in alignment therewith and having vanes upon its periphery providing a plurality of passages for the other fluid terminating in substantially the same transverse plane as the longitudinal aperture in said core, and a casing supported by said basal part and forming a mixing chamber in advance of said core there being communication between said mixing chamber and the basal part at both sides of said partition.

10. A plural fluid spray nozzle adapted to discharge liquid into the open comprising in combination an elongated hollow basal part having near one end thereof an interior partition forming a plurality of adjacent substantially parallel passages for the admission of fluids, a pipe for the passage of one of said fluids extending forwardly from said partition and substantially axially of said basal part, a longitudinally apertured core connected with said pipe in alignment therewith and having vanes upon its periphery providing a plurality of passages for the other fluid terminating in substantially the same transverse plane as the longitudinal aperture in said core, a casing supported by said basal part and forming a mixing chamber in advance of said core and means for imparting a whirling motion to the fluid passing through said pipe there being communication between said mixing chamber and the basal part at both sides of said partition.

In testimony whereof, I have signed my name to this specification.

LEE H. PARKER.